Claims:

1. An intraocular lens comprising:

a lens portion defining an anterior surface layer and a posterior surface layer;

an interior of the lens portion comprising an array of deformable cells each defining a volume of a selected fluid therein, each deformable cell in substantial engagement with either the anterior or posterior surface layer;

a micropump configured to control fluid flow to alter the volume in at least a portion of the array of deformable cells to deform the anterior or posterior surface layer and alter an optical parameter of the lens.

2. The intraocular lens of claim 1 wherein the array of deformable cells defines an axis that is substantially perpendicular to the anterior or posterior surface layer.

3. The intraocular lens of claim 1 wherein the array of deformable cells comprises round cells.

4. The intraocular lens of claim 1 further a reservoir communicating with each deformable cell via an inflow channel, the micropump interposed in the inflow channel between the deformable cell and the reservoir.

5. The intraocular lens of claim 4 wherein the micropump is photo-activated.

6. The intraocular lens of claim 4 wherein a single reservoir communicates with a subset of the array of deformable cells.

7. The intraocular lens of claim 1 further comprising a reservoir communicating with each deformable cell via an outflow channel and a relief valve interposed in the outflow channel between the deformable cell and the reservoir.

8. The intraocular lens of claim 7 wherein the relief valve is photo-activated.

9. The intraocular lens of claim 4 wherein the reservoir is located within a periphery of the intraocular lens.

10. The intraocular lens of claim 1 wherein the micropump comprises a bistable nickel-titanium alloy.

11. A power adjustable intraocular lens comprising:

a resilient lens body defining an anterior curvature and a posterior curvature;

an interior portion of the lens body including an array of deformable fluid-filled structures that engage a surface element of the lens body;

a micropump configured to control fluid flow into or out of at least one fluid-filled structure to thereby controllably deform and alter an optical parameter of the lens.

12. The intraocular lens of claim 11 further comprising:

a first reservoir in communication with an interior chamber of at least one fluid-filled structure via a first channel;

wherein the micropump is interposed in the first channel to control fluid flows to the interior chamber of the at least one fluid-filled structure.

13. The intraocular lens of claim 12 further comprising:

a second reservoir in communication with the interior chamber of at least one fluid-filled structure via a second channel; and

a relief valve interposed in the second channel to controlling fluid flows from the interior chamber of the at least one fluid-filled structure.

14. The intraocular lens of claim 13 wherein the first reservoir defines a high internal fluid pressure relative to each fluid-filled structure and the second reservoir defines a low internal fluid pressure relative to each fluid-filled structure.

15. The intraocular lens of claim 11 wherein the micropump is actuable by application of energy from an external source.

16. The intraocular lens of claim 12 wherein the micropump is photo-thermally actuated.

17. The intraocular lens of claim 13 wherein the relief valve system is normally closed and is openable by application of energy from an external source.

18. The intraocular lens of claim 17 wherein the relief valve is photo-thermally actuated.

19. The intraocular lens of claim 11 wherein the body of the fluid-filled structures and the fluid have matching indices of refraction.

20. The intraocular lens of claim 11 wherein the fluid-filled structures define a deformable engagement portion that engages a deformable surface element of the intraocular lens.

21. The intraocular lens of claim 11 wherein the array of deformable fluid-filled structures range in number between 1 and 500.

22. The intraocular lens of claim 11 wherein each one of the array of deformable fluid-filled structures has a cross section ranging between about 20 microns and 5 mm.

23. The intraocular lens of claim 11 wherein the array of deformable fluid-filled structures define a dynamic range between a retracted position and an extended position of between about 1 microns and 100 microns.

24. A method of adjusting the power of an intraocular lens comprising:

providing an intraocular lens body with a plurality of deformable fluid-filled structures in an interior of the intraocular lens that engage a surface element of the intraocular lens body; and

controllably altering the volume of the fluid within selected fluid-filled structures by selectively actuating a micropump to deform at least one of the fluid-filled structures and the surface element, thereby altering an optical parameter of the intraocular lens.

25. The method of claim 24 further comprising providing an index-matched fluid in a space in the intraocular lens body between an interior of the surface element and an exterior of the deformable fluid-filled structures.

26. The method of claim 24 wherein actuating a micropump comprises actuating a micropump with light energy from an external source.

27. The method of claim 24, further comprising actuating at least one relief valve from a normally closed position to an open position with light energy from an external source.